ANALYTIC R E V I E W

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Medication Adherence, When Lifestyle Is the Medicine

Abstract: *Giving patients insight, knowledge, and skills, although important, may not alone be enough for behavior change maintenance. Rather, the health care provider (HCP) has an important role in fostering behavior change and maintenance by asking, “Why do people change?” and “What can I do to help?” This review highlights 4 evidence-based factors related to medication adherence, when lifestyle is the medicine. (1) Autonomy is the belief that one is the origin of his or her own actions, and must be supported by the HCP (eg, “My HCP listens to how I would like to do things regarding my health”). (2) Competence and confidence ensure that patients believe they can succeed. These are gained through mastery experience, vicarious experience, and through positive and constructive feedback on past performance (eg, “My HCP conveys confidence in my ability to make changes regarding my health”). (3) Coping planning is being able to formulate a plan of intention, with the awareness of barriers and emotional regulation that can inhibit patient behavior (eg, “I feel able to share my feelings with my HCP”). (4) Personal values of the patients are used to understand how and why they cope when there is a threat to these values (eg, “My HCP tries to understand how I see my health before suggesting any changes”).*

Keywords: patient behavior; maintenance; value; autonomy; coping; self-efficacy

As with any medicine, those who practice lifestyle medicine hope that the patient will adhere to the prescription. However, lifestyle

1. Give insight: If you can just make patients see, then they will change.
2. Give knowledge: If patients just know enough, then they will change.
3. Give skills: If you can just teach people how to change, they will do it.
4. Give patients a hard time: If one can make people feel badly or afraid enough, they will change.

Similarly, there is an assumption that if one knows what successful maintainers do, one can simply tell others who struggle with maintenance to adopt those same tendencies . . .

change is a big pill to swallow for many patients, despite their motivation to do so.¹ Behavioral and lifestyle medicine research and practice is at a crux, where evidence abounds on the promotion of health behavior change in patients, but many desire an answer to the question, “How does one get patients to maintain their behavior change?”

Historically, practitioners have focused their efforts on encouraging behavior change and maintenance.²

Clearly, it is helpful to provide the insight, knowledge, and skills that people need, but one must also recognize the limitations in this approach alone. Similarly, there is an assumption that if one knows what successful maintainers do, one can simply tell others who struggle with maintenance to adopt those same tendencies (eg, exercise, eat breakfast, self-weight, watch less TV, set realistic goals).³⁻⁵ However, such efforts commonly fall short. Practitioners should be asking questions,

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such as, “Why do people change?” and “What can a provider do to help?” The present review will highlight factors that help answer these questions.

Autonomy

Autonomy is 1 of 3 basic psychological needs of all humans (alongside relatedness or meaningful relationships and competence). It represents the belief that one is the origin of his or her own actions (ie, volition, freedom, self-determination).⁶ Autonomy is essential in understanding the what and why of patients’ goal pursuits, especially because it is integrated with one’s values and sense of self—of which goals are derived. So, if autonomy is satisfied, growth, well-being, and behavioral effort toward goals can be maintained.

However, if autonomy is not satisfied, then goal pursuits are theoretically thwarted while also increasing the risk of pathology and ill-being.^{6,8} Practitioners must then determine what prescriptions and efforts support autonomy.

Autonomy Support

First, autonomy requires the power to choose. For example, a patient trying to adopt a healthier eating pattern might believe that she does not have much choice. Rather, she may feel forced to eat from a short and unappealing list of vegetables. Autonomy is not satisfied, potentially undermining her motivation to eat healthy. However, if she is provided with a much longer list of options and recipes, and perhaps is able to try new dishes, her autonomy could then be satisfied.

Patients prescribed to increase physical activity can face a similar concern, in that they perceive few options. Our example patient from above might perceive that the only choice that she has is to use the dreaded elliptical machine. Her autonomy is not satisfied. To avoid this, the practitioner could provide a list of moderate intensity physical activities (3–6 METs) from the Physical Activity Compendium (<https://sites.google.com/site/compendiumofphysicalactivities/>

home). The patient could use this list to highlight the activities that she already enjoys, perhaps intrinsically, while choosing other new activities.

Options become especially important when barriers challenge the patient’s choices. For example, a patient, “Susan,” has chosen to walk outside in her neighborhood for the past week at 7:00 AM. However, on this particular morning, it is cold and raining. What does Susan do? Too commonly, if she is like others trying to adopt an active lifestyle, her only choice might be to do nothing. On the other hand, if she had options (ie, alternatives), such as going to the gym, walking at the mall, watching a free exercise video online, or walking on her treadmill, she could then maintain her activity behavior without interruption or potential relapse.

Individuals living in rural and urban areas who perceived 4 places to exercise had a 3.8 and 5.3 times increased odds of meeting physical activity guidelines, respectively, than those who perceived zero places to exercise.⁹ In addition, the odds increased with each perceived place of exercise. A single perceived place to exercise doubled the odds of meeting physical activity guidelines. Thus, the practitioner might ensure that patients perceive that at least 4 options for the respective behavior (eg, physical activity) are available. This could be done in a way that enables the patient to perceive his or her current options while also facilitating the patient to discover new options. In this way, options are provided, but behavior is not forced on the patient.

To support autonomy, the goal is “to reduce resistance by assuring the patient that you know that you cannot make them do anything—it is their choice.”^{2(p23)} Practitioners can use the simple, 15-item Healthcare Climate Questionnaire to gauge how well their current practice is supporting autonomy.¹⁰ Consider how your patients would answer the following items:

1. I feel that my health care provider (HCP) has provided me choices and options about my health.

2. I am able to be open with my HCP about my health.
3. My HCP listens to how I would like to do things regarding my health.

Clearly, if patients rate these items highly, they feel support to be autonomous, which can affect their motivation to maintain. The weight loss maintenance research has provided clear evidence of the importance of ensuring an environment that supports autonomy. Williams et al¹⁰ found that the effect of a weight loss program on maintaining weight loss after 2 years was positively related to the patients’ autonomous (self-determined) motivation to stay in the program. Yet patients’ motivation was directly affected by how much they perceived support from the program to be autonomous in their weight loss behavior. Similar findings have been shown with physical activity and weight loss maintenance after 3 years.¹¹ This highlights the importance of perceptions of autonomy support to influence self-determined motivation and subsequently influence maintenance of health behavior.

Competence and Confidence

Like autonomy, competence is thought to be a basic human need. The aforementioned Healthcare Climate Questionnaire also contains the following items.

1. My HCP conveys confidence in my ability to make changes regarding my health.
2. My HCP has made sure I really understand my health risk behavior and the benefits of changing these behaviors without pressuring me to do so.
3. I feel a lot of trust in my HCP.

There is a saying, “If I believe I can, I might. If I believe I can’t, I probably won’t.” Providers try to ensure that patients believe that they can succeed. When these feelings of competence or confidence are undermined, the patient

is less likely to initiate and maintain lifestyle changes.

Just as the perceptions of options improve the odds of meeting physical activity guidelines, so does self-efficacy—the belief in one's ability to do a specific task or behavior. Compared with no confidence in meeting physical activity guidelines (150 minutes per week of moderate intensity activity), those who were “very confident” had 3 times the odds of meeting physical activity guidelines.¹² Even those who were “somewhat confident” had twice the odds of meeting the guidelines.

Mastery Experience

The first way to improve self-efficacy is through experiences of mastery, which arise from effective personal performance.¹³ Certain performances of behaviors enhance perceptions of personal mastery, but others do not. One's own accomplishments, especially those that are perceived as successful, provide an authentic experiential foundation for confidence and successful expectations.

The goal for the practitioner is to help patients choose behaviors that are perceived as challenging, yet attainable. If the lifestyle prescription is perceived as too challenging or difficult, confidence can be diminished. At the same time, if the prescription is too easy, patients might not gain any confidence in their abilities. In addition, patient expectations of personal mastery can affect both their initiation and persistence with behavior, even in the face of challenges.¹³

In physical activity, for example, a graded mastery experience with an increasingly difficult exercise prescription was not associated with greater adherence.¹⁴ Thus, self-efficacy might not be the mere accomplishment of tasks or behaviors, as is commonly seen with goal-setting strategies. Rather, a key component of mastery experience is the patient's perspective that the personal behavioral performance has been successful. Notice the perception of success is that of the patient, not the HCP. For example, a patient who is trying to adopt an active lifestyle might

say, “I only did 30 minutes of physical activity this week.” The patient does not perceive his or her efforts to be successful. The HCP could incorrectly confirm this unsuccessful attempt, because it did not meet the predetermined standard of the lifestyle prescription of 150 min/wk. Alternatively, the HCP could help the patient see the 30 minutes as quite successful in light of other challenges. This approach could potentially enhance mastery experience.

Vicarious Experience

Patients can perceive lifestyle prescriptions as intimidating or threatening, which will undermine their confidence. However, they can gain confidence by seeing others perform the same behaviors without the adverse consequences that they believe might occur.¹³ They might also believe that they will improve if they persist in their efforts, encouraging them to model the other person's behavior and intensity. Modeling can be strengthened when patients view models as credible, similar to themselves, valuing the same outcome, and someone they aspire to be.

Modeling also includes practitioners “practicing what they preach.” Lobelo et al¹⁵ examined how physical activity habits of physicians and medical students influence their own counseling practices and stated, “In conclusion, we have shown compelling evidence indicating that physicians' health matters, and that physicians' personal physical activity practices influence their clinical physical activity attitudes and practices.”^{15(p2)} Interestingly, they found that the effect of the practitioner's own health habits on counseling practices was independent of many demographic, training, and clinical practice factors.

In a study by Frank et al,¹⁶ patients entering a general medical clinic waiting room were randomly assigned to either a control or disclosure group. In the control group, patients watched a physician give a brief educational video about improving diet and exercise. In the disclosure group, the physician disclosed an additional 30 s of

information about her own personal healthy dietary and exercise habits. There was also the added touch of a bike helmet and an apple visible on her desk, which was not present in the control video. A significantly higher percentage of patients in the disclosure group (vs the control group) reported higher ratings on how healthy the doctor seemed, how much they believed what the doctor said about exercise and diet, and being more motivated and encouraged by the doctor to exercise or eat a healthy diet in their own life. These studies suggest that HCPs have an important role in modeling a healthy lifestyle for the patient. However, it is not that the HCP should be free of barriers or struggles to maintain a healthy lifestyle; rather their own efforts can provide a foundation for patient confidence through vicarious experience and modeling.

Verbal Persuasion

With verbal persuasion, people can be prompted to believe that they can successfully handle and cope with challenges that occur while changing a behavior that might have overwhelmed them in the past.¹³ An encouraging word can go a long way. To provide an increase in a patient's sense of confidence, the practitioner can help the patient locate and amplify the more positive, persuasive voice, “You can do it.” In addition, one important aspect is teaching the patient to locate this voice internally when they need it. Imparting this skill has the added benefit of limiting the constant use of the HCP.

However, verbal persuasion alone might not be enough to provide long-term benefits to self-efficacy.¹⁴ The persuasiveness might come in the form of constructive feedback on past performance, rather than a simple reassurance. As mentioned with mastery experience, patients should be made aware of their personal successes. In-depth informative feedback can be used to clarify and provide rationale as to why some strategies to change and maintain behavior were successful and others were not.

Emotional Arousal

Emotions that come from stressful and taxing situations, such as lifestyle change and maintenance, provide valuable information regarding one's sense of personal competency.¹³ High or aversive arousal can debilitate or undermine healthy behavioral efforts. For example, monitoring one's weight can be distressing, and there are a number of ways to cope that do not include physical activity or healthy eating (eg, avoidance, comfort food, suppressing appetite, using supplements).¹⁷ The emotions provide feedback that must be interpreted in a positive fashion to build the confidence needed to behave in a particular way. As previously discussed, the HCP can be aware of how the patient is responding, to adjust prescriptions in order to maximize confidence and motivation.¹ Also, more recent research suggests that helping patients see difficult situations in a more flexible, mindful, and nonjudgmental way could aid in coping.¹⁸

Health behaviors can lead to negative feelings as well. Research supports that lower levels of positive affective responses to exercise (eg, pleasure, energy), especially in patients classified as obese, account for low levels of physical activity maintenance.¹⁹ Furthermore, the response to a single bout of moderate-intensity aerobic exercise in inactive adults has been shown to predict physical activity 6 and 12 months later.²⁰

A major reason for the interindividual differences in affective responses to behaviors, such as exercise, is the perceived confidence in one's own personal abilities (eg, self-efficacy). Previous research illustrates how perceptions of self-efficacy (ie, how well they think they did) directly influence how one feels and subsequently interprets an exercise session.²¹ In addition, this research supports structuring lifestyle prescriptions in a way that maximizes both mastery experience and positive feedback, which will subsequently support self-efficacy.²² Changes (increase or decrease) in

perceptions of self-efficacy over time relate to changes in exercise behavior, including long-term maintenance.²³

Coping Planning

Feelings and emotions clearly play a role in the adoption of healthy lifestyle behaviors. The Healthcare Climate Questionnaire confirms the role of the HCP in emotional regulation.

1. My HCP encourages me to ask questions.
2. My HCP handles my emotions very well.
3. I feel very good about the way my HCP talks to me about my health.
4. I feel able to share my feelings with my HCP.

The awareness of such feelings, ideally in more a mindful, nonjudgmental fashion, can allow both the practitioner and the patient to formulate a plan to cope with both the feelings and challenges that will come along with the behavioral maintenance. One such way of coping is called *coping planning*, which is making a plan that anticipates difficulties or barriers that might hinder the patient's implementation of their intentions to live a healthy lifestyle.^{24,25} As previously highlighted,¹ a gap exists between people's intentions and actual lifestyle behavior. *Action planning*, or implementation intentions, are first made to provide "if . . . then" statements to help connect a patient's intention to actually following through with the behavior.

For example,

"If I wake up at 6:00 AM tomorrow morning, then I will get ready and immediately go jogging in the neighborhood."

On the other hand, a *coping planning* statement would look like,

"If it is raining too cold in the morning, then I will go to the gym instead of jogging in the neighborhood."

Notice how the action plan is a simple statement, while the coping plan anticipates personal challenges or barriers to completing the action plan. In this way, the patient can create a sense of control over unwanted concerns or distractions to their behavior. Coping planning might be more effective because difficulties that must be self-regulated are common and coping planning implies action planning.²⁶ Research in physical activity suggests that both action and coping planning could be used to help individuals connect intention to behavior in the short term; however, coping planning appears to have a larger effect on behavior over time.²⁵

Intention and coping planning can be measured in practice. Sniehotta et al²⁴ developed a short scale that asks patients, "I have made a detailed plan regarding . . ."

1. what to do if something interferes with my plans;
2. how to cope with possible setbacks;
3. what to do in difficult situations in order to act according to my intentions;
4. which good opportunities for action to take;
5. when I have to pay extra attention to prevent relapses;

Answers are rated on a 4-point scale: 1 = *completely disagree*; 2 = *disagree*; 3 = *agree*; 4 = *totally agree*.

Others make suggestions for specific behaviors,²⁶ such as smoking cessation, asking, "I have a detailed plan . . ."

1. how to respond when a friend offers me a cigarette;
2. how to avoid a high-risk situation where the urge to smoke might overwhelm me;
3. how to arrange my daily routines to minimize temptations to smoke.

Answers, in this case, are rated on a similar 4-point scale: 1 = *not at all true*; 2 = *barely true*; 3 = *mostly true*; 4 = *exactly true*.

In both these examples, the key is having the patient focus on potential high-risk thoughts, situations, or barriers that will challenge the consistency of a healthy lifestyle prescription. Without coping planning, the most admirable and honest of intentions can fail, preventing long-term maintenance of any health behavior.

Personal Values and Self-worth

The Health Care Climate Questionnaire highlights:

1. I feel my HCP *understands how I see things* with respect to my health.
2. I feel that my HCP *accepts me* whether I follow their recommendations or not.
3. I feel that my HCP *cares about me as a person*.
4. My HCP *tries to understand how I see my health* before suggesting any changes.

Humanistic or values-based medicine emphasizes the values that underpin a holistic, lifestyle medicine view. This includes values, such as the importance of individuals and communities, human security and flourishing, and the value of individual human life (both quantity and quality),²⁷ adding “years to life and life to years.”²⁸ Common descriptions of evidence-based medicine emphasize research evidence, clinical expertise, and patient values. Thus, practicing evidence-based, lifestyle medicine assumes a relevant understanding of patient values.

To understand the values of each patient, one must first consider the patients’ view of their *actual self* (or self-concept), vision for a hoped *ideal self*, and concern to conform to an *ought self* out of duty or obligation.²⁹ Patients who feel discrepant between their actual and ideal self, can experience disappointment, dissatisfaction, or sadness. On the other hand, perceived discrepancies between one’s actual self-view and ought self-state can lead to more agitated-related emotions, such as fear, threat, or restlessness.⁷ The

practitioner can be aware of such feeling states to gain better insight into the patient’s view of self. An awareness of the patient’s feelings might also allow the practitioner to help protect against the patient creating an inappropriate ought self, in which the patient feels he or she must comply out of obligation or responsibility.¹

Patients’ self-concept helps them develop standards and values. These standards and values help guide the creation of particular goals, which then drive particular behaviors to reach these goals. Specifically, “We are motivated to reach a condition where our self-concept matches our personally relevant self-guides.”^{29(p321)} To understand patient goals and behavior (or lack thereof), one must understand the standards or values set by a patient’s self-concept.

To illustrate with a patient example: Maria wants to be healthier, but is having difficulty adopting a healthy dietary intake. Maria shares how much she values her strong cultural heritage and her role of passing these values and behaviors to her children, including dietary behaviors. By asking Maria to give up certain foods that might not have a favorable macronutrient or caloric content, one is really asking her to give up a part of her values and, potentially, a part of her self-concept. The prescription should be one that does not undermine, and potentially enhances, her values, role in her family, and sense of self.

In addition, people are motivated to sustain or restore their view of self—commonly referred to as self-preservation. One clinical tactic for behavior change is to help the patient see that their behavior is incongruent, incompatible, or discrepant with their personal core values. Those who maintain behavior changes, especially before behavior reaches a habitual level requiring little self-regulatory effort, are able to see their behavior in the shadow of their personal values and standards. In a way, they can transcend the immediate situation, with its challenges and difficulties, to stay in line with goals, values, and standards that they have.³⁰

One might pass up on the dessert today for a longer-term health goal (ie, how he or she will look in a bathing suit next summer, or to stay in line with their self-concept or identity as a “healthy eater”). Generally speaking, when one becomes immersed in the present moment, without consideration of their values, ideals, and longer-term goals, they are at risk of self-regulatory failure.³⁰

Self-concept theoretically exists in a hierarchy, where one’s overall view of self is affected by numerous lower-level self-views and values (eg, professional, social, academic, or physical self-concept). However, if the HCP does not know what value is perceived as threatened, then proper value-based counseling is not possible. In addition, the HCP cannot assume that a particular diagnosis (eg, obese classification) threatens a particular domain of self-views.

As an example: Following her obese classification, Karen feels like her self-view of *attractiveness* is threatened. However, another patient who receives this same obese classification, Jill, feels like her *health* is threatened, but not her attractiveness. The HCP might emphasize the health concerns to both patients, but ends up only being effective and motivating to Jill and not Karen. This occurs because the health message mirrors the salient threat to Jill’s self-view (ie, health). Now, let’s say that both Karen and Jill feel like their attractiveness is threatened from the obese classification. However, the difference in why it is a threat occurs at the higher levels or domains of self-views. Karen believes that her being unattractive threatens her views of her *physical self*, whereas Jill believes that being unattractive threatens her *professional and social selves*.

Expanding on previous research on medical triggers³¹ and early work on appraisal stakes (what is at stake in a distressing situation),³² we are developing theoretical support for specific fundamental needs that can be threatened within the process of health behavior change and maintenance:

1. **Self-esteem:** The fundamental desire to maintain self-esteem and self-integrity or to feel better about oneself.
2. **Social Status:** The fundamental need to seek social inclusion and avoid exclusion, which can be threatened by risk of exclusion or evaluation.
3. **Sex:** The fundamental need for mating relationships and strategies, alongside maximizing reproductive success (eg, physical attractiveness, body image, mate value).
4. **Survival:** The fundamental need for survival, longevity, and disease avoidance, which could include perceptions of health, energy, and physical functioning.
5. **Family:** The fundamental need for one's role and investment as a parent, spouse, or member of a family unit.
6. **Spirituality:** The fundamental need to connect and have a relationship with a higher spiritual power. This need would also include living in a way that is representative of this identity (eg, a Christian) or in a way that fulfills a way of life, principles, laws, or dogma (ie, spiritual self).

These fundamental needs provide meaning and, when threatened, can promote behavior change to reduce the threat and preserve one's self-concept. The HCP can then examine the threat, the value, the motivation, and the behavioral choices of the patients to reduce the perceived threat. When efforts and reasoning are modified to match the patient values, health behavior prescriptions have greater personal meaning, which may aid in maintenance of these behaviors.

Conclusion

Value-based lifestyle medicine has the practitioner first asking, "What does the patient value?" With this insight, the practitioner can develop a practice that emphasizes and supports key evidence- and theoretically based factors that relate to behavioral maintenance. These factors include patient perceptions of autonomy, competence, self-efficacy, relatedness, emotional regulation, and coping

planning. The practitioner is encouraged to maintain awareness of the importance of psychological determinants and patient values. This allows for modification of lifestyle prescriptions and development of practice models that maximize lifestyle adherence, when lifestyle is the medicine.

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